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ABSTRACT

This paper outlines procedures for (1) identification and review of curricular materials and programs that can be used for articulating a complete process curriculum, (2) specification of synthesis tasks by which well designed materials can be augmented to be more effective and better articulated for classroom use, (3) development of teacher education materials and programs to insure utilization of instructional materials and procedures, and (4) development of evaluation procedures to determine the effectiveness of the augmented and articulated materials in relation to specified learning objectives. This plan, patterned after the Popham and Baker "Product Development Cycle," may be of interest to curriculum designers or educational change agents concerned with articulation and utilization of knowledge and technology in the form of existing curriculum materials. Related documents are EA 003 544, EA 003 546, EA 003 549, and EA 003 550. (Author/LLR)

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GENERALIZED SYNTHESIS PLAN

Synthesis Proceeds from Earlier Curricular Search and Analysis Efforts

See September 25, 1968, Detailed Procedural Plan for ADEPT

ED050492

R. F. Bickel & H. P. Cole

February 26, 1969

There are four components to this plan. Each component is listed below and constitutes a separate sub-plan. The first component must always be completed, but depending upon the status of the curricular units under construction, other phases may sometimes be skipped in whole or in part.

COMPONENT NUMBER	TITLE
1	Preliminary Review of Curricular Units and Specification of Synthesis Tasks
2	Generalized Instructional Materials Synthesis Plan
3	Generalized Teacher Education Materials and Program Synthesis Plan
4	Generalized Evaluation Plan

EA 003 545

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Component 1

PRELIMINARY REVIEW OF CURRICULAR UNITS AND SPECIFICATION OF SYNTHESIS TASKS

I. Initial selection of "cores" of units for synthesis effort by Program Advisory Committee upon recommendation of the analysis team. Units in cores are:

   A. Identified from search activities

   B. Judged to deal with common behavioral clusters

   C. Compatible for articulation into larger curricular sequences relevant to the total curriculum

II. General specification of the synthesis tasks for each component in the core (Program Advisory Committee, (PAC) or subcommittee of):

   A. Specification of objectives

   B. Augmentation, supplementation, revision, etc. of curricular materials and methods

   C. Augmentation and development of teacher education component

   D. Evaluation of program in relation to:

      1. Program management and characteristics
      2. Pupil behavior
      3. Teacher behavior

III. Select and train ERIE personnel for synthesis and development effort (PAC)

   A. Review existing ERIE staff member qualities for team membership

   B. Selection of synthesis teams

   C. Communicate ERIE process definition and philosophy to teams

   D. Present synthesis teams with selected materials identified in search activities

   E. Assign individual teams to the following activities

IV. Collection activities, (synthesis team) collect all:

A. Program philosophy statements

B. History of development documents

C. Related research documents

D. Teacher education materials

E. Instructional materials

1. Printed materials
2. Films
3. Games
4. Other

F. Evaluation materials

1. Instruments used in the evaluation of pupil behavior, teacher behavior, or program effectiveness
2. Formative and summative evaluation reports

V. Review activities: (synthesis team)

All documents and materials will be reviewed for the following purposes:

A. Assessment of the program on the existing ERIE criteria

1. Independently by each team member
2. Collaboratively by all team members in the preparation of a final rating

B. Commenting on each criterion to justify each rating

1. Independently by each team member
2. Collaboratively by all team members in the preparation of final justifying commentary

C. Specification of all central skills and processes

1. Independently by each team member
2. Collaboratively by all team members in a report

D. Assessment of the adequacy of:

1. Instructional materials, methods, and procedures
2. Teacher education materials
3. Evaluation devices for:

a. Pupil behavior
b. Teacher behavior
c. Program effectiveness

VI. Summarize program, (synthesis teams)

A concise, highly informative, descriptive analysis of the program should be prepared. Careful and precise specifications for such reports should be prepared. These specifications should be followed by all synthesis teams.

VII. ERIE review panel and PAC shall review the summative report (see Generalized Instructional Materials Synthesis Plan, Component 2 for description of ERIE review panel)

VIII. Specification of behavioral objectives (synthesis teams)

A. Enumerate central skills previously identified

B. State one or more behavioral correlates for each skill enumerated

C. Translate each statement of a behavioral correlate into language comprehensible to teachers

D. Specify a set of objectives for the program Such specification will involve:

1. A ranking of objectives in terms of priority relative to the value, utility, and generalizability of the skill
2. The sequencing of behavioral objectives in some form of a vertical transfer hierarchy

IX. Synthesis teams shall note and record correspondence between skills (behaviors) of the program and skills:

A. Common to other program reviewed and selected by ERIE search activities

B. Related to skills central to ERIE's interest and effort

START INSTRUMENT SEARCH AND DEVELOPMENT CYCLE

see Generalized Evaluation Plan, Component 4

X. Selection and specification of central behaviors to be promoted (synthesis teams)

A. Reexamine previously specified behavioral objectives for all central skills or behaviors (see Component 1, VIII)

B. Final selection of a core or cluster of central behaviors

C. Review of behavioral objectives to insure:

1. An adequate number of behavioral correlates have been stated
2. The behavioral objectives are common to

a. the several selected programs under review
b. behaviors deemed central to ERIE effort

XI. Program Advisory Committee familiarization review of central behaviors which have been selected and specified for promotion

A. By each synthesis team for their core of units

B. By all synthesis teams collectively

XII. ERIE review panel review of central behaviors which have selected and specified for promotion by synthesis teams. Recommendation shall be made to:

A. Emphasize central behaviors common to several cores or clusters of materials

B. Adopt or modify the promotion of the previously specified behaviors listed by synthesis teams

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Component 2

GENERALIZED INSTRUCTIONAL MATERIALS SYNTHESIS PLAN

I. Selection of ERIE review panel

A panel of synthesis team leaders and support personnel will be selected to guide and direct the augmentation, development and articulation of instructional materials.

II. Function of ERIE review Panel

It shall be a function of this panel to develop criteria designed to insure the high quality of all synthesized instructional materials. In addition this panel will be responsible for the review of all synthesized instructional products developed by ERIE teams. It shall be the duty of the panel to recommend modification of synthesized components. No instructional product synthesized or developed at ERIE will be used in collaborative or pilot schools without the permission of the panel. It will be necessary to define the function of each panel member.

III. Establish criteria for guidance of synthesis activities

A. Specify criteria which all synthesized instructional materials should meet e.g.

1. Must promote central behaviors
2. Must augment or supplement one of the previously selected programs
3. Must not violate developmental psychological considerations
4. Must lend itself to small group interaction

B. Rank criteria by priority

IV. Synthesize education and training (ERIE review panel)

A. Communicate results of all prior steps to <u>all</u> development teams

B. Specify the global dimensions of the synthesis effort (i.e. across teams dimensions)

C. Communicate to synthesis teams the criteria which all synthesized instructional materials should meet

START TEACHER EDUCATION PACKAGE CYCLE

See Component 3 , Generalized Teacher Education Materials and Program Plan

V. Identify shortcomings or gaps in the existing instructional materials of selected programs on the basis of program summary reports, criteria reports and recommendations of synthesis teams (ERIE review panel). See Component 1, items V and VII.

A. Enumerate limitations of instructional materials

B. Specify tasks for needed development or augmentation of selected programs, e.g.

1. Develop role playing situations for Productive Thinking Program
2. Develop (MATCH) kit for Productive Thinking Program
3. Develop manipulative inquiry games to promote the behaviors dealt with in the Productive Thinking Program and the House of Ancient Greece MATCH unit

C. Final selection and assignment of teams and team members to each development task (2-3 persons per task)

D. Establish deadline for completion of team development effort

VI. Instructional materials augmentation and development by synthesis teams

A. Procede with product development as outlined by ERIE review panel

B. Submit all development products to ERIE review panel

VII. Inhouse review of instructional components incorporated, synthesized, or developed by ERIE teams

The ERIE review panel will review all such materials for purposes of:

A. Suggesting modifications in the program or materials

B. Suggesting trial use of the program or materials in collaborative or pilot schools

C. Discarding such curricular materials

VIII. Trial use of synthesized instructional components in collaborative schools (formative evaluation procedure)

All instructional materials incorporated, synthesized, or developed at ERIE shall have been given clearance for use in collaborative schools. Materials shall be studied in the school setting for purposes of assessing:

A. Classroom management feasibility

B. Teacher acceptance

C. Pupil acceptance

D. Appropriateness of developmental level (psychological)

E. Instructional design

F. Durability of materials

G. Adaptability of materials to small group utilization and multiple use

H. Capability of promoting specified objectives (see Generalized Evaluation Plan)

IX. A concise, highly informative, descriptive report dealing with the trial use of materials in the collaborative school shall be written. (formative evaluation report)

X. Inhouse study by ERIE review panel of:

A. Experiences of staff members involved in the initial trial use of the instructional materials

B. Formative evaluation or assessment report dealing with initial trial use of instructional materials

XI. Decision by ERIE review panel to:

A. Modify and supplement instructional materials

B. Recycle development of materials through the preceding sequence

C. Disseminate materials to additional schools

D. Hold materials for future ERIE efforts

E. Discard materials

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Title Generalized Synthesis Plan 1969

Author [redacted] H. Cole

Date Completed (or projected) Feb. 26, 1969 No. Pages 16

Description:

This is a plan which outlines procedures for: (1) the identification and review of curricular materials and programs which can be used toward articulating a complete process curriculum (2) the specification of synthesis tasks by which well designed materials can be augmented to be more effective and better articulated for classroom use, (3) the development of necessary teacher education materials and programs to insure successful utilization of the instructional materials and procedures, and (4) the development of evaluation procedures designed to determine the effectiveness of the augmented and articulated materials in relation to specified learning objectives. The plan is patterned after the Popham and Baker "Product Development Cycle" and may be of interest to curriculum designers or educational change agents interested in the articulation and utilization of knowledge and technology in the form of existing curriculum materials. Recommend file with ERIC.

Audience Curriculum Designers/ Theorists, Change Agents Media Print

Present Form Complete (2nd draft) Procedural outline

Return to D. King

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*I removed my name. RBickel

Assessment battery needed for second cycle of all instructional materials used in collaborative schools. See Component 4 , Generalized Evaluation Plan.

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Component 3

GENERALIZED TEACHER EDUCATION MATERIALS AND PROGRAM SYNTHESIS PLAN

I. Develop criteria for effective teacher education materials and program

These criteria should be developed by the ERIE review panel - see Component 2. Representative examples of criteria are:

A. Teacher education program shall be constructed to require extensive teacher-teacher interaction

B. Teacher education program and materials shall demand that teachers be actively involved in the instruction of elementary school students using related innovative program

II. Collection activities

See collection activities - Component 1

III. Review activities

See review activities - Component 1

IV. Judgment of adequacy of existing teacher education materials and program

This judgment shall be made by the ERIE review panel based upon an examination of program criteria reports, summary reports, and synthesis team recommendations (See Component 1, items V and VI. The ERIE review panel will decide to:

A. Modify, augment, or supplement the existing materials and program

B. Use the existing program without further modification

C. Reject the teacher education materials and program

V. Specify and record needed augmentation, supplementation, and development of teacher education materials and program (synthesis team)

A. Identify limitations in existing materials and program

B. Enumerate all program and materials limitations which need:

1. Revision
2. Supplementation
3. Replacement

VI. Teacher education materials and program development specification - Phase 1, (ERIE review panel, PAC)

A. Specify particular tasks related to development of teacher education materials and program

B. Select and specify ERIE personnel as teams corresponding to development tasks

C. Define role of each team member

D. Communicate criteria for effective teacher education program and materials to staff members

E. Establish deadlines for products produced by development teams

VII. Teacher education materials and program product development - Phase 1

Synthesis teams shall produce the teacher education materials according to the above specifications

VIII. Review of team produced teacher education materials and program - Phase 2

A. Inhouse review of team produced teacher education materials and program (ERIE review panel)

B. Decision by ERIE review panel to:

1. Modify development products
2. Try products at collaborative school

a. summer workshops
b. inservice training sessions

3. Reject development products

IX. Teacher education materials and program development Phase 2

If the ERIE review panel or the synthesis team feels the initial product must be modified, the synthesis team shall revise the original product

X. Development cycle-summer workshop - Phase 3

A. Trial use of teacher education materials and program with collaborative school teachers (summer workshop)

B. Assess effectiveness of teacher education program and materials using criteria such as:

1. Management feasibility
2. Teacher acceptance
3. Appropriate design

C. Report assessment results

A concise, highly descriptive informative report describing the trial use of the teacher education materials and program shall be prepared.

XI. Review of teacher education materials and Program Phase 3

A. Inhouse review of the initial summer workshop materials and program by ERIE review panel

B. Decision by ERIE review panel to accept, modify or reject existing teacher education materials and program package

At this point, the teacher education materials and program may be recycled through stage 2 above.

XII. Trial use of teacher education materials and program: Inservice teacher training - Phase 4

A. Trial use of teacher education materials and program with collaborative school teachers (inservice workshop)

B. Assessment of effectiveness of teacher education program and materials using criteria such as:

1. Management feasibility
2. Teacher acceptance
3. Appropriate design

C. Report assessment results

A concise, highly descriptive informative report describing the trial inservice use of the teacher education materials and program shall be prepared.

D. Inhouse review of the initial inservice workshop materials and program by ERIE review panel.

E. Decision by ERIE review panel to accept, modify, or reject existing teacher education materials and program package.

If the decision is made to modify or reject the teacher education package, the above phases may be repeated.

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Component 4

GENERALIZED EVALUATION PLAN

It will be necessary to conduct a search for existing instruments and assessment devices which may be used to measure changes in pupil behavior, changes in teacher behavior, and program characteristics and effectiveness.

I. Instrument search for assessment of pupil behavior

A. Translate the objectives which have been previously specified (See Component 1, VIII) into needs for:

1. Tests of cognitive skills
2. Test of affective skills
3. Tests of knowledge (content acquisition)

B. Identify techniques, scales, procedures useful in assessing such things as:

1. Pupil-pupil interaction
2. Change in frequency of approach behavior relative to avoidance behavior in relation to self-initiated exploration, divergent production, hypothesis formation, etc.

II. Instrument search for assessment of teacher behavior

The nature of these programs is such that it should cause great changes in teacher behavior if they are properly used. Such changes should emerge in a striking manner if classrooms are subjected to interaction analysis techniques. It should also be possible to obtain measure of frequency changes in the approach versus avoidance behavior of the teacher relative to:

A. Self-initiated, spontaneous student activity

B. Spontaneous student-student interaction

C. Authoritativedogmatic statements of fact, relationship, or principle by the teacher

It is also apparent that classroom observation is necessary to assess the general climate of the classroom. This was done in the evaluation of the Productive Thinking Program by the Wisconsin R & D Center and it was also done by the Children's Museum in Boston in the evaluation of the MATCH units. A number of elaborate forms for assessing classroom climate by trained observers are available. Others will need to be developed.

III. Program characteristics and effectiveness

Although much of the effectiveness of the program may be determined by the evaluation activities outlined above, there may be additional techniques of assessing characteristics of the program relative to:

A. Its management

B. Teacher acceptability

C. Administrative acceptability

D. Community approval

IV. Draw up a list of specifications describing instruments and assessment devices needed for all phases of evaluation efforts

V. Preparation of an evaluation battery

A. Identify sources of instruments and assessment devices

B. Selectively collect instruments and assessment devices which appear to meet the specified evaluation needs

C. Examine and review all instruments selected as being potentially relevant

D. Match instruments to specified evaluative needs which include:

1. Specified pupil behaviors derived from program objectives
2. Specified needs for assessment of teacher behavior
3. Specified needs for assessment of program characteristics and effectiveness

E. List available instruments which correspond to the specified evaluated needs

F. Identify and collect all documents dealing with validity, reliability, norms, etc., for each instrument or assessment device previously deemed appropriate

G. Review and study documents relating to each instrument

H. Prepare a highly informative, descriptive concise report which summarizes the information gained from the above activities

I. Decision concerning which instruments shall be used in the assessment battery

VI. Preparation of comprehensive battery

A. Assemble selected existing instruments to form an initial battery

B. Determine gaps in the initial battery

C. Supplement the initial battery of existing instruments by:

1. Modification of existing instruments
2. Design of new instruments

D. Conduct reliability, validity studies of new or modified instruments

E. Assemble comprehensive battery of instruments

F. Specify what the battery assesses relative to:

1. Pupil behaviors
2. Teacher behaviors
3. Program characteristics and effectiveness

VII. Development of instructional and evaluative techniques and instruments to be used by teachers for the purpose of assessing and reporting pupil progress

A. Examine comprehensive battery in order to identify instruments and procedures with potential to:

1. Assess pupil progress
2. Diagnose student readiness for:

    a. cognitive skills objectives
    b. affective skills objectives
    c. content acquisition objectives

B. Develop diagnostic tests of the type outlined above where needed

C. Relate diagnostic tests to skills and objectives previously specified

D. Determine reliability and validate diagnostic tests

E. Develop multiple forms of all diagnostic tests to be used as achievement tests

F. Relate achievement tests to diagnostic tests (insure that achievement tests are equivalent forms of diagnostic tests)

G. Conduct validity and reliability studies for all achievement tests